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**Agilent Technologies**

## Facsimile Cover Sheet

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To: Bridget C. Monroe  
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(Including Cover Page)

Message: RE: U. S. Patent Application No. 10/765,647  
Filed January 26, 2004  
Attorney Docket No: 10030763-1

Enclosed are:

1. Response to Notification of Non-Compliant Appeal Brief

Respectfully Submitted,

*J. Krause-Polstorff / MW*  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Applicant: Laura Wills Mirkarimi

Group Art Unit: 1765

Serial No.: ~~10/765,047~~ 10/765,647

Examiner: Duy Vu Nguyen Deo

Filed: January 26, 2004

For: METHOD FOR ETCHING HIGH ASPECT RATIO FEATURES IN III-V BASED  
COMPOUNDS FOR OPTOELECTRONIC DEVICES

Attorney Docket No. 10030753-1

Commissioner for Patents

P.O. Box 1450

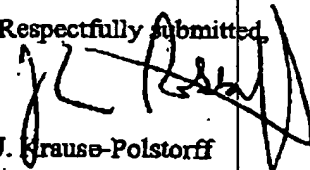
Alexandria, VA 22313-1450

Sir,

This communication is in response to the Notification of Non-Compliant Appeal  
Brief (37 CFR 41.37) mailed on August 28, 2006.

Pursuant to MPEP 1205.03(B), the attached two pages replace the originally filed  
SUMMARY OF CLAIMED SUBJECT MATTER in the APPEAL BRIEF filed on  
August 7, 2006.

Respectfully submitted,

  
J. Krause-Polstorff  
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Sept. 28, 2006  
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SEP 28 2006

## SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention is directed to a method for combining Reactive Ion Etching (RIE) with bromine based chemistry to etch III-V based compounds such as InP.

Mixtures of HBr with CH<sub>4</sub> and H<sub>2</sub> provide fast etch rates, vertical sidewalls and good control over the growth of polymers that arise from the presence of CH<sub>4</sub> in the mixture. In accordance with the invention, HI or IBr or some combination of group VII gaseous species (Br, F, I) may be substituted for HBr. Typical values in accordance with the invention for mixtures of HBr, CH<sub>4</sub> and H<sub>2</sub> are HBr in the range of about 2 to 75 percent, CH<sub>4</sub> in the range of about 5 to 50 percent and H<sub>2</sub> in the range of about 5 to 40 percent by volume at pressures in the range from about 1 to 30 mTorr.

A method for etching high aspect ratio features in III-V based compounds for optoelectronic devices in accordance with the invention is described starting on page 3, line 1 of the specification, shown in FIGs. 1a-c. The method as recited in Claim 1 for etching a III-V semiconductor material (110) comprises placing a semiconductor substrate (105) on which the III-V semiconductor material (110) has been deposited into a reactive ion etching reactor (205); introducing a first gas chosen from HBr, HI and IBr into the reactive ion etching reactor (205), introducing a second gas of CH<sub>4</sub> into the reactive ion etching reactor (205), introducing a third gas of H<sub>2</sub> and exposing a portion of the III-V semiconductor material (110) to be etched to a mixture comprising the first, the second and the third gas.

A method for etching high aspect ratio features in III-V based compounds for optoelectronic devices in accordance with the invention is described starting on page 3, line 1 of the specification, shown in FIGs. 1a-c. The method as recited in Claim 12 for

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etching a III-V semiconductor substrate (105) comprises placing the semiconductor substrate (105) into a reactive ion etching reactor (205); introducing a first gas chosen from HBr, HI and IBr into the reactive ion etching reactor (205), introducing a second gas of CH<sub>4</sub> into the reactive ion etching reactor (205), introducing a third gas of H<sub>2</sub> and exposing a portion of the III-V semiconductor material (110) to be etched to a mixture comprising the first, the second and the third gas.

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